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In this issue:

What's happening at the AHL?

- **Dr. Jeff Caswell**, mammalian pathologist in our Guelph lab, successfully defended his PhD thesis entitled "*The role of interleukin-8 as a neutrophil chemoattractant in bovine pneumonic pasteurellosis*" at WCVM in Saskatoon on September 28, 1998. Congratulations Jeff!
- In September and October, **Dr. Grant Maxie**, Manager of the AHL, consulted widely with clients and service providers in order to draft a 5-year strategic plan for the AHL. Your comments on our future direction are welcome. **Dr. Beverly McEwen** was acting manager during this time.
- We have updated charges on tests sent to labs in the USA because of the **change in the Cdn$/US$ exchange rate** - we now convert at 1.5X rather than 1.4X. Also, fees have increased for some of these external tests, and we pass on the increase.
- **Dr. Marina Brash**, pathologist, avian and fur-bearers, left the AHL in October to take up a job in private industry.
- Please note that **the submitter is responsible for charges on an AHL case**. Rapid and accurate billing demands that we do not change the "**bill to**" information after entry into VADDS.
- Gone missing ..... The AHL provides clinics with **boxes and milk vials for culture** free of charge. Please help us to contain our costs and your fees by using these materials only for AHL milk submissions.

Season's Greetings from the staff of the Animal Health Laboratory.
We look forward to serving you in the coming year.

Feedback for the AHL?

Please feel free to call, fax, or E-mail us at any of our labs.

HORSES

Viral causes of acute respiratory disease in horses

Dr. Susy Carman

Contagious respiratory infections in horses can occur as a result of infection with many different viruses, mycoplasma and bacteria. The viruses that can result in equine respiratory disease are:

1. **Equine influenza virus type A subtype 1**(AE1:H7N7)
2. **Equine influenza virus type A subtype 2** (AE2; H3N8)
3. **Equine herpesvirus type 1** (EHV-1) - equine abortion virus; previously called EVR
4. **Equine herpesvirus type 2** (EHV-2) - equine cytomegalovirus
5. **Equine herpesvirus type 4** (EHV-4) - equine viral rhinopneumonitis (EVR)
6. **Equine rhinovirus type 1** (ERV-1)
7. **Equine rhinovirus type 2** (ERV-2)
8. **Equine rhinovirus type 3** (ERV-3)
9. **Equine arteritis virus** (EVA)
10. **Equine adenovirus** (EAV)

The severity of clinical disease due to these viruses is dependant on the virulence of the viral isolate, dose, management, environmental conditions, and host defenses. Subclinical infections are common and occur in association with partial immunity as a result of maternal antibody, vaccination, or previous infection.

The clinical signs of disease can be similar for these viruses, with no clinical sign characteristic of any one virus infection. Therefore diagnosis is very dependent on isolation of virus from nasal swabs, pharyngeal swabs or buffy coat cells. These samples must be collected early in the course of clinical disease when animals are still viremic. This time corresponds to the period of pyrexia. Swabs for **virus isolation** should be submitted to the laboratory in virus transport medium. For co-culture of buffy coat cells, submit 20 ml of EDTA blood.

A **serological diagnosis** can be made using paired sera, with acute and convalescent sera collected 3 weeks apart. These paired sera need to be tested together on the same day for comparisons to be made between antibody titers. Seroconversion (negative to positive), or a 4-fold change in antibody titer between acute and convalescent sera, is considered significant.

In recent studies, we found equine rhinovirus type 2 to be commonly associated with acute respiratory disease in horses in Ontario (1). Rhinoviruses are members of the picornavirus family. **Although host specific, rhinoviruses cause "colds" in humans, as well as horses**. These small, non-enveloped, hardy viruses should not be confused with equine viral rhinopneumonitis virus (a herpesvirus) that is often referred to as "rhino".

Vaccines are not available in North America for equine herpesvirus type 2, equine rhinoviruses types 1,2,3, or equine adenovirus.

For more information on methods for diagnosis of viral diseases of horses at the AHL, please call **Dr. Susy Carman** at 519-824-4120 ext 4551.

Reference

Carman S, Rosendal S, Huber L, Gyles C, McKee S, Willoughby RA, Dubovi E, Thorsen J, Lein D.
Infectious agents in acute respiratory disease in horses in Ontario. J Vet Diagn Invest 9:17-23. 1997.

New fluorescent antibody test for equine herpesvirus 1/4
Dr. Susy Carman

Equine herpesvirus type 1 (EHV-1), also termed equine abortion virus, is a cause of abortion storms in mares. This virus can also elicit severe respiratory disease. Some strain may induce neurological disease.

Equine herpesvirus type 4 (EHV-4), now termed equine rhinopneumonitis virus, also causes respiratory disease, but clinical disease is generally less severe than that caused by EHV-1. EHV-4 has only occasionally been associated with abortions in individual horses and has not been linked with neurological disease.

EHV-1 and EHV-4 are antigenically similar, such that virus neutralizing serology tests and antigen detection tests using polyclonal antibodies do not differentiate between these viruses. They can be differentiated from each other only using restriction endonuclease analysis of viral DNA or monoclonal antibodies. Previously these viruses were collectively called "equine rhinopneumonitis virus" or "rhino".

The AHL now offers a direct FA tests using polyclonal antisera for EHV 1/4 for:
1. **tissues from aborted fetuses (lung, liver, kidney)**
2. **lung from neonates that have died with pneumonia**

This **EHV 1/4 FA test** is **not** useful for the brain of adults that have died with suspected herpesvirus neurological disease, since the neurological lesions are believed to be a consequence of EHV-1 antigen-antibody complexes that form in the walls of small blood vessels. This event results in the loss of neurons due to anoxia, rather than direct virus infection of cells.

For more information on this new FA test, please contact **Dr. Susy Carman** at 519-824-4120 ext 4551.

SWINE

PCR assay for porcine circovirus
Dr. Hazel Alexander

Porcine circovirus type II has become increasingly prominent in the literature for its potential role in post-weaning multisystemic wasting syndrome (PMWS). **The AHL is now offering a PCR assay for the detection of porcine circovirus in tissues**. With this assay, we are able to detect both the **European strain** (now referred to as porcine circovirus type I, and considered non-pathogenic) and porcine **circovirus type II**. After amplification, we can differentiate between the two types by restriction enzyme digestion of the PCR product.

If you have cases with clinical signs suggestive of PMWS, please submit the following tissues for analysis (minimum of two tissues/animal): respiratory disease - lung, tonsil, bronchial lymph node; GI disease - ileum, mesenteric lymph node, liver. Please bag each tissue in a separate leakproof bag, labeled in waterproof marker with the animal identification and tissue type. Freeze immediately after collection at -20 C and ship with ice packs by courier. When submitting samples from multiple animals, samples should be collected with separate instruments to prevent cross-over contamination.

The fee for circovirus PCR is $15/sample.
For more information, please call **Dr. Hazel Alexander** at 519-824-4120, ext 4316.

CATTLE

Nonesterified fatty acids (NEFA) as a measure of energy balance in cattle

Dr. Brent Hoff

Negative energy balance in the final weeks of gestation is an important risk factor for the development of postpartum disease in cattle. Late-gestation dairy cows are especially at risk of negative energy balance because their energy needs are increasing due to fetal growth, while their feed intake is frequently decreasing.

Fat is mobilized from adipose tissue in the form of nonesterified fatty acids (NEFA) when dietary intake is insufficient to meet the animal's needs. German workers have observed intensive post- partum lipolysis, with NEFA values reaching their maximum one week after calving and normalizing up to eight weeks after calving. The incidence of several diseases (retained placenta, ketosis, displaced abomasum, mastitis) was noted to increase as NEFA values of cows increased. These same workers noted that NEFA values do not remain elevated under chronic energy deficits.

Some indications for NEFA testing:

- Ration appears adequate but there is a high incidence of peripartum disease.
- The producer is reluctant to believe that fresh cow problems originate in the dry cow diet.
- The ration has been changed recently.

Protocol for herd sampling for NEFA: At least five cows should be sampled from those in the last month of gestation. Serum should be separated as soon as possible (<2 hrs) and kept refrigerated until tested. Falsely elevated NEFA values may result if samples are allowed to come to room temperature.

Interpretation: NEFA values at 2 to 4 weeks prepartum should be less than 0.3 mEq/L. For the last two weeks prepartum, NEFA values should be less than 0.4 mEq/L. A problem is indicated if two or more cows out of five are above these reference values. Remember that **high NEFA levels indicate negative energy balance**. Cows in early lactation should have NEFA values less than 0.5 mEq/L. These levels are tentative, but conservative, based on our experience.

Reference:

Herdt TH. The relationship of non-esterified fatty acid concentrations to postpartum disease incidence in dairy cows. Proc. 11th ACVIM Forum. 1993: 501-504.

RECENT PUBLICATIONS

Carman S, van Dreumel T, Ridpath J, **Hazlett M**, Alves D, DuBovi E, Tremblay R, Bolin S, Godkin, Anderson N. Severe acute bovine viral diarrhea in Ontario 1993-1995. J Vet Diagnost Invest 1998; 10: 27-35.

Duckmanton L, **Carman S**, Nagy E, Petric M. Detection of bovine torovirus in fecal specimens of calves with diarrhea from Ontario farms. J Clin Microbiol 1998; 36:1266-1270.

Dyson DH, **Maxie MG**, Schnurr D. Morbidity and mortality associated with anesthetic management in small animal veterinary practice in Ontario. J Am Anim Hosp Assoc 1998; 34: 325-335.

Ellis JA, West KH, Cortese VS, Myers SL, **Carman PS**, Martin KM, Haines DM. Lesions and distribution of viral antigen following an experimental infection of young seronegative calves with virulent bovine virus diarrhea virus- type II. Can J Vet Res 1998; 62: 161-169.

Marinov GR, Marois Y, **Maxie G**, Guidoin R. Characterization of abnormalities responsible for immediate rejection of porcine aortic valves for the manufacture of bioprostheses. Artificial Organs 1998; 22: 687-697.

Poppe C, **Smart N**, Khakhria R, Johnson W, Spika J, Prescott J. Salmonella typhimurium DT 104: A virulent and drug-resistant pathogen. Can Vet J 1998; 39: 559-565.

Sutton GA, Viel L, **Carman PS**, Boag BL. Pathogenesis of equine herpesvirus-1 in experimentally infected ponies in vivo. Can J Vet Res 1998; 62: 49-55.

RECENT PRESENTATIONS

McEwen S, **Smart N**, Tan E, **McEwen B**. Antibiotic policy and the occurrence of resistance in Canada. 25th International Dairy Congress, Aarhus, Denmark, Sept 21-24, 1998.

Animal Health Laboratory Accreditations:
American Association of Veterinary Laboratory Diagnosticians (AAVLD) (lab system)
Thyroid Registry of the Orthopedic Foundation for Animals Inc. (OFA) (thyroid function)
Canadian Food Inspection Agency (CFIA) (EBL, EIA)
Canadian Association of Environmental
Analytical Laboratories (CAEAL) (metals)

Mailing list

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Laboratory Services Division, University of Guelph, Box 3612,
Guelph, Ontario, Canada N1H 6R8.
Editor: Dr. Grant Maxie.

Animal Health Laboratory, Guelph
Phone: 519-824-4120 ext 4501
Fax 519-821-8072
Email gmaxie@lsd.uoguelph.ca

Animal Health Laboratory, Kemptville
Phone 613-258-8320
Fax 613-258-8324
Email dstevens@kemptvillec.uoguelph.ca

Animal Health Laboratory, Ridgetown
Phone 519-674-1551
Fax 519-674-1555

Email jgough@ridgetownc.uoguelph.ca